AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1-21. (Cancelled)

22. (Currently Amended) In a data processing system that executes a program of instructions, a method for inverting a point X on a distorted surface in a detail-in-context presentation for display on a display screen, comprising the steps of:

(a) locating a first approximation point P_i for an inversion of the point X, wherein the point P_i is on an undistorted surface; and,

(b) obtaining a point P_i^D by displacing the point P_i onto the distorted surface by applying a distortion function D; calculating a magnitude of the difference $|P_i^D - X|$ between the point X and the point P_i^D; ~~and,~~ determining whether the point P_i is acceptable for the inversion of the point X by comparing the magnitude of the difference to a tolerance δ ; and, displaying the point P_i on the display screen if the point P_i is acceptable for the inversion of the point X .

23. (Previously Presented) The method of claim 22 and further comprising the steps of :

(c) locating a next approximation point P_{i+1} for the inversion of the point X if the approximation point P_i is not acceptable for the inversion of the point X; and,

(d) repeating steps (b) and (c) until the approximation point is acceptable for the inversion of the point X.

24. (Previously Presented) The method of claim 23 and further comprising the step of selecting the tolerance δ.

25. (Previously Presented) The method of claim 24 wherein the tolerance δ is a fraction of a width of a pixel for a computer display surface.

26. (Previously Presented) The method of claim 25 wherein the fraction includes one-half.

27. (Previously Presented) The method of claim 22 wherein the undistorted surface is included in the detail-in-context presentation.

28. (Previously Presented) The method of claim 23 and further comprising the step of constructing a line RVP-X from a point RVP above the undistorted surface, through the point X, and through the undistorted surface to locate the first approximation point P_i at a point of intersection of the line RVP-X and the undistorted surface.

29. (Previously Presented) The method of claim 28 wherein the point RVP is a reference viewpoint for the detail-in-context presentation.

30. (Previously Presented) The method of claim 29 and further comprising the steps of:

projecting the point P_i^D onto the line RVP-X to locate a point P_i^P, wherein the point P_i^P is a closest point to the point P_i^D on the line RVP-X; and,

projecting the point P_i^P onto the undistorted surface in a direction opposite to that of a displacement due to distortion to locate the next approximation point P_{i+1} for the inversion of the point X, wherein the displacement due to distortion is given by a line F_o - F constructed through the undistorted surface and a focus F of the distorted surface, and wherein the point P_{i+1} is located on the undistorted surface at a point of intersection of the undistorted surface and a line constructed parallel to the line F_o - F and passing through the point P_i^P.

31. (Previously Presented) The method of claim 23 and further comprising the step of bisecting the point P_i to counter divergence in successive approximations of the point P_i due to folds or discontinuities in the distorted surface.

32. (Previously Presented) The method of claim 22 wherein the undistorted surface is a plane.

33. (Previously Presented) The method of claim 22 wherein the distorted surface is defined by the distortion function D.

34. (Previously Presented) The method of claim 33 wherein the distortion function D is an n-dimensional function, wherein n is an integer greater than zero.

35. (Previously Presented) The method of claim 34 wherein the distortion function D is a three-dimensional function.

36. (Previously Presented) The method of claim 33 wherein the distortion function D is a lens function.

37. (Currently Amended) A system for inverting a point X on a distorted surface in a detail-in-context presentation, the system having memory, a display, and an input device, the system comprising:

a processor coupled to the memory, display, and input device and adapted for:

(a) locating a first approximation point P_i for an inversion of the point X, wherein the point P_i is on an undistorted surface; and,

(b) obtaining a point P_i^D by displacing the point P_i onto the distorted surface by applying a distortion function D; calculating a magnitude of the difference $|P_i^D - X|$ between the point X and the point P_i^D; ~~and,~~ determining whether the point P_i is acceptable for the inversion of the point X by comparing the magnitude of the difference to a tolerance δ; and, displaying the point P_i on the display if the point P_i is acceptable for the inversion of the point X.

38. (Previously Presented) The system of claim 37 wherein said processor is further adapted for:

(c) locating a next approximation point P_{i+1} for the inversion of the point X if the approximation point P_i is not acceptable for the inversion of the point X; and,

(d) repeating (b) and (c) until the approximation point is acceptable for the inversion of the point X.

39. (Currently Amended) A computer program product having a computer readable medium tangibly embodying computer executable code for directing a data processing system to invert a point X on a distorted surface in a detail-in-context presentation for display on a display screen , the computer program product comprising:

code for (a) locating a first approximation point P_i for an inversion of the point X, wherein the point P_i is on an undistorted surface; and,

code for (b) obtaining a point P_i^D by displacing the point P_i onto the distorted surface by applying a distortion function D; calculating a magnitude of the difference $| P_i^D - X |$ between the point X and the point P_i^D; ~~and,~~ determining whether the point P_i is acceptable for the inversion of the point X by comparing the magnitude of the difference to a tolerance δ ; and, displaying the point P_i on the display screen if the point P_i is acceptable for the inversion of the point X .

40. (Previously Presented) The computer program product of claim 39 and further comprising:

code for (c) locating a next approximation point P_{i+1} for the inversion of the point X if the approximation point P_i is not acceptable for the inversion of the point X; and,

code for (d) repeating (b) and (c) until the approximation point is acceptable for the inversion of the point X.

41-42. (Cancelled)

43. (Currently Amended) In a data processing system that executes a program of instructions, a method for determining a distance on an undistorted surface between a first point X_1 and a second point X_2 on a distorted surface in a detail-in-context presentation for display on a display screen, comprising:

inverting the point X_1 by:

locating a first approximation point P_{i1} for an inversion of the point X_1, wherein the point P_{i1} is on the undistorted surface; and,

obtaining a point P_{i1}^D by displacing the point P_{i1} onto the distorted surface by applying a distortion function D; calculating a magnitude of the difference $| P_{i1}^D - X_1 |$ between the point X_1 and the point P_{i1}^D; and, determining whether the point P_{i1} is acceptable for the inversion of the point X_1 by comparing the magnitude of the difference $| P_{i1}^D - X_1 |$ to a tolerance δ;

inverting the point X_2 by:

locating a first approximation point P_{i2} for an inversion of the point X_2, wherein the point P_{i2} is on the undistorted surface; and,

obtaining a point P_{i2}^D by displacing the point P_{i2} onto the distorted surface by applying a distortion function D; calculating a magnitude of the difference $| P_{i2}^D - X_2 |$ between the point X_2 and the point P_{i2}^D; and, determining whether the point P_{i2} is acceptable for the inversion of the point X_2 by comparing the magnitude of the difference $| P_{i2}^D - X_2 |$ to the tolerance δ; ~~and,~~

calculating a magnitude of the difference $| P_{i1} - P_{i2} |$ between the approximation points P_{i1} and P_{i2} ; and,

displaying the magnitude of the difference $| P_{i1} - P_{i2} |$ on the display screen .

44. (Previously Presented) The method of claim 43 wherein the first point X_1 is on a first disported surface defined by a first distortion function D_1 and the second point X_2 is on a second distorted surface defined by a second distortion function D_2.

45. (Currently Amended) In a data processing system that executes a program of instructions, a method for inverting a point X on a distorted surface in a detail-in-context presentation for display on a display screen, comprising the steps of:

(a) locating a first approximation point P_i for an inversion of the point X, wherein the point P_i is on an undistorted surface;

(b) obtaining a point P_i^D by displacing the point P_i onto the distorted surface by applying a distortion function D; calculating a magnitude of the difference $|P_i^D - X|$ between the point X and the point P_i^D; and, determining whether the point P_i is acceptable for the inversion of the point X by comparing the magnitude of the difference to a tolerance δ;

(c) locating a next approximation point P_{i+1} for the inversion of the point X if the approximation point P_i is not acceptable for the inversion of the point X by: constructing a line RVP-X from a point RVP above the undistorted surface, through the point X, and through the undistorted surface to locate the first approximation point P_i at a point of intersection of the line RVP-X and the undistorted surface, wherein the point RVP is a reference viewpoint for the detail-in-context presentation; projecting the point P_i^D onto the line RVP-X to locate a point P_i^P, wherein the point P_i^P is a closest point to the point P_i^D on the line RVP-X; and, projecting the point P_i^P onto the undistorted surface in a direction opposite to that of a displacement due to distortion to locate the next approximation point P_{i+1} for the inversion of the point X, wherein the displacement due to distortion is given by a line F_o - F constructed through the undistorted surface and a focus F of the distorted surface, and wherein the point P_{i+1} is located on the undistorted surface at a point of intersection of the undistorted surface and a line constructed parallel to the line F_o - F and passing through the point P_i^P ~~; and,~~

(d) repeating steps (b) and (c) until the approximation point is acceptable for the inversion of the point X ; and,

(e) displaying the approximation point on the display screen .

46. (Currently Amended) A computer program product having a computer readable medium tangibly embodying computer executable code for directing a data processing system to invert a point X on a distorted surface in a detail-in-context presentation for display on a display screen , the computer program product comprising:

code for (a) locating a first approximation point P_i for an inversion of the point X, wherein the point P_i is on an undistorted surface;

code for (b) obtaining a point P_i^D by displacing the point P_i onto the distorted surface by applying a distortion function D; calculating a magnitude of the difference $| P_i^D - X |$ between the point X and the point P_i^D; and, determining whether the point P_i is acceptable for the inversion of the point X by comparing the magnitude of the difference to a tolerance δ;

code for (c) locating a next approximation point P_{i+1} for the inversion of the point X if the approximation point P_i is not acceptable for the inversion of the point X; ~~and,~~

code for (d) repeating (b) and (c) until the approximation point is acceptable for the inversion of the point X ; and,

code for (e) displaying the approximation point on the display screen .

47. (Currently Amended) In a data processing system that executes a program of instructions, a method for inverting a point X on a distorted surface in a detail-in-context presentation for display on a display screen, comprising the steps of:

(a) locating a first approximation point P_i for an inversion of the point X, wherein the point P_i is on an undistorted surface;

(b) obtaining a point P_i^D by displacing the point P_i onto the distorted surface by applying a distortion function D; calculating a magnitude of the difference $| P_i^D - X |$ between the point X and the point P_i^D; and, determining whether the point P_i is acceptable for the inversion of the point X by comparing the magnitude of the difference to a tolerance δ;

(c) locating a next approximation point P_{i+1} for the inversion of the point X if the approximation point P_i is not acceptable for the inversion of the point X; and,

(d) repeating steps (b) and (c) until the approximation point is acceptable for the inversion of the point X ; and,

(e) displaying the approximation point on the display screen .

48. (Currently Amended) A system for inverting a point X on a distorted surface in a detail-in-context presentation, the system having memory, a display, and an input device, the system comprising:

a processor coupled to the memory, display, and input device and adapted for:

(a) locating a first approximation point P_i for an inversion of the point X, wherein the point P_i is on an undistorted surface;

(b) obtaining a point P_i^D by displacing the point P_i onto the distorted surface by applying a distortion function D; calculating a magnitude of the difference $|P_i^D - X|$ between the point X and the point P_i^D; and, determining whether the point P_i is acceptable for the inversion of the point X by comparing the magnitude of the difference to a tolerance δ;

(c) locating a next approximation point P_{i+1} for the inversion of the point X if the approximation point P_i is not acceptable for the inversion of the point X; and,

(d) repeating (b) and (c) until the approximation point is acceptable for the inversion of the point X ; and,

(e) displaying the approximation point on the display .

49. (Cancelled)